REGISTRATION FORM FOR CZECH SCIENTIFIC INSTITUTION

1. Research institution data (name and address):

University Centre for Energy Efficient Building
Czech Technical University in Prague
Trinecka 1024
273 43 Bustehrad, Czech Republic

2. Type of research institution: Public university (veřejná vysoká škola)

3. Head of the institution: Ing. Robert Jára, Ph.D.

4. Contact information of designated person(s) for applicants:

Kristina Reist – Research projects coordinator
e: kristina.reist@cvut.cz, +420 773 744 228

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5. Research discipline in which the strong international position of the institution ensures establishing a Dioscuri Centre:

Natural Sciences and Technology: *Systems and communication engineering* - electronics, communication, optoelectronics

6. Description of important research achievements from the selected discipline from the last 5 years including a list of the most important publications, patents, or other results:

CTU UCEEB systematically supports application projects with output to practice and contractual projects with the application sphere. UCEEB ČVUT is implementing about 111 applied research projects, funded by both Czech and European grant providers.

Since 2016, over 497 contracts for contract applied research and a number of innovation vouchers have been concluded. UCEEB has sold 14 utility model licenses, filed 15 patents and 57 utility models. In addition, it has a number of applied results extending functional samples and prototypes, among which successful technology transfers include the S.A.W.E.R. project presented at the EXPO 2021 World Exhibition in Dubai and the so-called "solar bench" presented at EXPO 2015 in Milan, a wireless technology enabling remote radio reading of water meters.

Related to the chosen topic, we can list following results and publications.

Patents

A Building Ventilation System Comprising at Least One Ventilation and Heating and Cooling Unit with Increased Heat Collection (Czechia. Patent CZ 308018. 2019- 09-11.); authors: Včelák, J.; Mazanec, V.; Mlejnek, P.; Vodička, A.; Kny, M.; Adamovský, D.

A Building Ventilation System Containing at Least One Ventilation and Heating/Cooling Unit with a Specific Passive Module Arrangement (Czechia. Patent CZ 308043. 2019-10-02.); authors: Včelák, J.; Mazanec, V.; Mlejnek, P.; Vodička, A.; Kny, M.; Adamovský, D.

Utility models

An Energy System for Buildings with Increased Resilience (Czechia. Utility Model CZ 32341. 2018-11-19.); authors:Včelák, J.; Hrabal, D.

Publications:

Laboratory and In-Situ Testing of Integrated FBG Sensors for SHM for Concrete and Timber Structures, DOI: https://doi.org/10.3390/s20061661

Simulation of a simple PV system for local energy usage considering the time resolution of input data2, DOI: https://doi.org/10.1016/j.est.2017.10.009

Environmental Testing of a FBG Sensor System for Structural Health Monitoring of Building and Transport Structures, DOI: https://doi.org/10.1016/j.prostr.2019.08.097

7. List of no more than 3 important research projects in the selected discipline awarded in national and international calls to the institution in the last 5 years:

Title: **PLUG-AND-USE RENOVATION WITH ADAPTABLE LIGHTWEIGHT SYSTEMS**

Name of P: Ing. Jan Včelák, Ph.D.

Source of funding: European Commission, H2020

Amount of funding: 7 975 924 EUR

Title: **Innovative ventilation unit with thermoelectric modules for control of air temperature**

Name of PI: Ing. Jan Včelák, Ph.D.

Source of funding: Technology Agency of the Czech Republic

Amount of funding: 19 606 931 CZK (app. 784 000 Eur)

Title: **Advanced sensors and sensor data processing methods**

Name of P: Ing. Jan Včelák, Ph.D.

Source of funding: Technology Agency of the Czech Republic

Amount of funding: 180 048 000 Czk (app.7 202 000 EUR)

8. Description of the available laboratory and office space for a Dioscuri Centre:

Laboratory: Development, implementation and tests of electronic components and systems

The Laboratory is equipped for the development and testing of products from the stage of development of electronics to mechanical design, development of firmware and software to testing itself. The subjects of interests are primarily sensors and sensor systems that can be used in buildings. In the field of structures diagnostics are used sensors on the basis of fiber optics that are possible integrate into various building elements.

Office space

CTU UCEEB provides equipped offices for its research and administrative staff. As part of the basic equipment, each employee has his/her own workstation, personal computer/laptop with internet connection and free access to the shared equipment such as printers, scanners, copiers, projectors, audiovisual equipment, etc., according to the needs of the activities performed.

9. List of the available research equipment for a Dioscuri Centre:

Electronic devices

power sources, oscilloscopes, spectral analyzer, measuring systems, soldering workplace

Diagnostic systems

thermal camera, endoscopic camera, precise accelerometers, laser measurers, magnetometers and metal detectors

3D printing center FORTUS 400mc

quick production of prototypes, modeling space of 406 × 355 × 406 mm, resolution up to 0.127 mm, materials ABS-M30, PC-ABS, PC, PC-ISO, ULTEM

Spectral analyzers – measured spectrum from 200 to 1750 nm, precision of measuring ±20 pm, dynamic range up to 60 dB

Interrogator – measured spectrum from 1270 to 1650 nm, precision of measuring ±1 pm, maximum number of wave channels 1000, detection threshold -40 dBm

Laser source – C+L band, width of the spec-tral line <100 kHz, tuning step: 1 pm, output 15 dBm

Welding kit – Fitel S178A including the optical fi breaker, quick weld in seven seconds, allows for directly welded on connectors

10. List of the additional benefits (other than listed in the conditions for hosting a DC, see invitation) that the Institution declares to provide for a Dioscuri Centre (i.e.: additional funds, personal benefits, dual career options, relocation support or other):

- 30 days holiday
- Meal allowance
- Language courses and further training
- Flexible working hours
- Opportunity to travel abroad and attend Czech and international conferences as part of projects
- Kids and dogs friendly office
- Friendly team and free coffee (and bubbly water)
- Work in a modern building in a quiet environment near Prague (possibility of using shared transport)
- Interesting and innovative environment on the border between academy and corporate environment
- Opportunity to implement own ideas and personal development

11. Other information about the internationalization of the research institution, international researchers employed at the institution, the availability of English language seminars etc.:

CTU UCEEB cooperates with a number of foreign research institutions. We are promoting international mobility of our staff as well as hosting of international colleagues/students. In these cases, English language is our means of communication. Internal communication (group staff emails, newsletters etc.) is conducted in English. The language of our seminars is always adapted to the composition of the participants. If attended by a foreign participant, the event is conducted in English.

At this moment, we have 13 colleagues in our team and one student fellow from abroad.